

## March 2015 Regional Climate Summary

### For the San Francisco Bay Area and Monterey Bay Area

**March 2015 was a very warm and dry month.** In fact, March 2015 was the warmest March on record at nearly a dozen climate stations across the region and the second warmest March at several other locations. Rainfall was scarce during March. The majority of climate stations accumulated less than 10 percent of their average March rainfall.

#### March Precipitation:

In contrast to the warm and dry conditions that prevailed during most of March, the month began cool and showery. On Sunday, March 1 an upper low centered over the Central California Coast produced numerous showers and isolated thunderstorms, mainly over Monterey and San Benito Counties.



***Thunderstorm just to the south of Salinas during the evening of Sunday, March 1. Photo: Miguel Santiago***

Unsettled weather continued into Monday, March 2. A line of showers and isolated thunderstorms over southern Monterey Bay moved inland across northern Monterey County. Thunder was heard in Castroville and pea sized hail fell at the National Weather Service Forecast Office in Monterey. By early afternoon lightning was observed between Milpitas and Fremont, while portions of San Jose experienced heavy rain and small hail. Nearly all of the precipitation that fell during the first two days of March was confined to areas from San Jose southward. Big Sur picked up over a half inch of rain on March 1 and 2, while areas from San Francisco and Oakland northward had no measurable precipitation.

On March 5<sup>th</sup>, the NWS Climate Prediction Center announced that a long-anticipated El Niño had developed over the tropical Pacific. However, this particular El Niño was forecast to remain weak and have little influence on weather and climate. More information on the current El Niño can be found at the link below:

During the early morning hours of March 11 a weak weather system moved through the area, dropping light rain. Mount Hamilton picked up 0.31" of rain with this system. All other locations accumulated less than a tenth of an inch.

There was only one other precipitation event during March. This one occurred from the late evening hours of March 22 through mid-morning on the 23<sup>rd</sup>. Portions of Marin County and Santa Cruz County picked up between a quarter and a half inch of rain, otherwise rainfall amounts were less than a quarter of an inch.

Rainfall totals for March were well below normal across the entire region. Most climate stations across the San Francisco Bay Area received less than 10 percent of their average March rainfall. Locations near Monterey Bay fared a bit better compared to the San Francisco Bay Area, with slightly higher percent-of-normal rainfall values for March. Only one location, Watsonville, managed to accumulate more than 20 percent of its average monthly rain total.

Petaluma's 0.08" rain total for March tied for the driest March on record at that location:

Driest March on Record				
Location	Normal March Rainfall (inches)	March 2015 Rainfall	Previous Driest March and Year	Length of Climate Record (yrs)
Petaluma Airport	3.79	0.08 (tie)	0.08 in 1988	101

Seven other climate stations experienced their second driest March on record:

Second Driest March on Record				
Location	Normal March Rainfall (inches)	March 2015 Rainfall	Driest March and Year	Length of Climate Record (yrs)
Angwin	5.66	0.21	0.05 in 1988	73
Napa	3.87	0.10	0.02 in 1923	118
Oakland Airport	3.08	0.09	0.04 in 1956	54
Oakland Museum	3.39	0.05	0.03 in 1988	44
Occidental	7.42	0.38	0.33 in 1994	71
Redwood City	3.13	0.05	0.00 in 1934	96
San Francisco Airport	2.96	0.06	0.05 in 1988	71

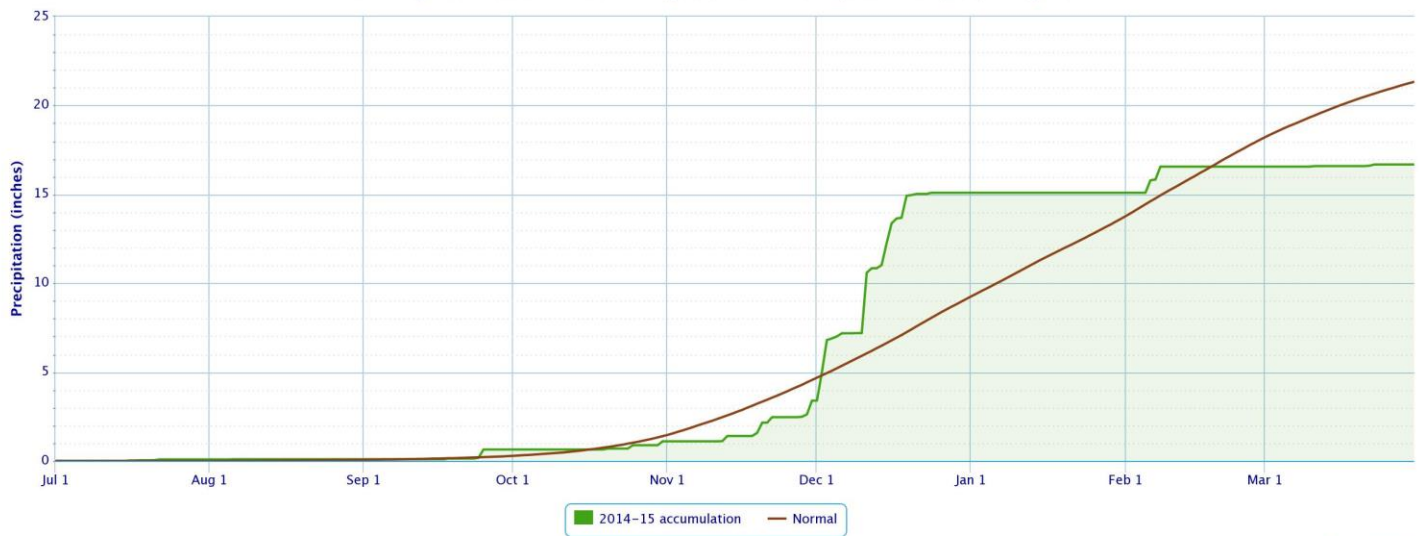
Five more climate stations had their 3<sup>rd</sup> driest March, including Calistoga, Cloverdale, Sonoma, Half Moon Bay, and Gilroy.

Downtown San Francisco, with 166 years of precipitation data, experienced its 4<sup>th</sup> driest March.

Year-to-date rainfall totals (for the rain year beginning July 1, 2014) were running above normal at the beginning of the calendar year, thanks to much above normal rainfall in December. However, since Christmas there has been only one significant rain event (early February) and just a few other light rain events. Consequently, year-to-date rainfall totals slipped below normal sometime during February or March at most locations.

### Accumulated Precipitation – SAN FRANCISCO DWTN, CA

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



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**Accumulated precipitation since July 1, 2014 (green line) at Downtown San Francisco, compared to normal (brown line). Note how accumulated rainfall surged well above normal during a wet December, but then dropped below normal by late February and continued to fall farther below normal during March.**

### March Regional Precipitation Summary:

Location	March Rainfall	Normal Mar Rainfall	Percent of Normal
<b>North Bay</b>			
Angwin	0.21	5.66	4
Calistoga	0.31	5.77	5
Cloverdale	0.42	6.16	7
Kentfield	0.40	6.56	6
Napa	0.10	3.87	3
Napa Airport	0.07	2.50	3
Occidental	0.38	7.42	5
Petaluma Airport	0.08	3.79	2
San Rafael	0.27	4.59	6
Sonoma County Airport	0.12	4.98	2
Sonoma	0.13	4.39	3
<b>San Francisco Peninsula</b>			
Half Moon Bay	0.18	4.22	4
Redwood City	0.05	3.13	2
San Francisco Airport	0.06	2.96	2
San Francisco Downtown	0.12	3.26	4

<b>East Bay</b>	<b>March Rainfall</b>	<b>Normal Mar Rainfall</b>	<b>Percent of Normal</b>
Antioch	0.40	2.08	19
Berkeley	0.23	3.86	6
Concord	0.10	2.53	4
Concord Airport	0.17	2.37	7
Fremont	0.32	2.92	11
Hayward Airport	0.10	2.63	4
Livermore	0.25	2.36	11
Livermore Airport	0.19	2.20	9
Martinez	0.13	2.86	5
Mount Diablo Junction	0.38	3.52	11
Newark	0.20	2.34	9
Oakland	0.05	3.39	1
Oakland Airport	0.09	3.08	3
Richmond	0.29	3.37	9
<b>South Bay &amp; Santa Cruz County</b>			
Ben Lomond	0.44	7.16	6
Gilroy	0.05	3.00	2
Los Gatos	0.05	3.63	1
Moffett Federal Airfield	0.16	2.26	7
Mount Hamilton	0.48	4.04	12
San Jose	0.19	2.54	7
Santa Cruz	0.51	4.63	11
Watsonville	0.66	3.63	18
Watsonville Airport	0.67	2.78	24
<b>Monterey and San Benito Counties</b>			
Big Sur Station	0.55	6.67	8
Carmel Valley	0.33	3.07	11
Hollister	0.25	2.36	11
King City	0.10	2.20	5
Monterey	0.44	3.38	13
Monterey Airport	0.31	2.76	11
Pinnacles National Park	0.43	3.11	14
Salinas	0.42	2.74	15
Salinas Airport	0.19	2.26	8

## March Temperatures:

Persistent high pressure produced warm and dry weather during most of March. Record highs occurred on March 6, 7, 13, 14, 26, 28 and 29. The warmth on Saturday, March 14 was notable for a couple of reasons. First, daily high temperature records were broken by very large margins at some locations on the 14th. For example, Salinas exceeded its record high by 13 degrees and Monterey surpassed its record high by 11 degrees. The second reason the warmth on the 14<sup>th</sup> was notable was that five locations set new record highs for the entire month of March.

### Saturday's Record Warmth

**Ten locations set or tied daily high temperature records on Saturday, March 14, 2015.**

**In addition, 5 locations set or tied record high temperatures for the entire month of March.**

Location	Saturday's High	Previous Daily Record & Year	Previous March Record High & Date
Salinas Airport	92*	84 in 1951	88, 3/9/1934
Salinas	90*	77 in 2004	89, 3/11/2005
Gilroy	90*	87 in 2013	90, 3/20/1997
San Jose	89*	81 in 2004	88, 3/17/1914
Santa Cruz	89	82 in 1926	
Monterey	87*	76 in 2004	85, 3/7/1953
San Francisco	84	81 in 2007	
Moffett Field	83	82 in 2004	
Oakland	81 (tie)	81 in 2004	
Oakland AP	79	77 in 2004	

\* Record high for the entire month of March and earliest in the year that it has been this warm

*Social media graphic listing daily and monthly high temperature records set on Saturday, March 14.*



Average high temperatures for March were well above normal across the entire region. In some cases, March 2015 average highs exceeded the 30-year average (normal) by as much as ten degrees. Average low temperatures were also above normal at all climate stations, with higher elevation locations seeing the greatest departures from normal. **Eleven climate stations experienced their warmest March on record:**

Warmest March on Record				
Location	Normal March Average Temp	March 2015 Average Temp	Previous Warmest March and Year	Length of Climate Record (yrs)
Antioch	55.4	62.4	59.7 in 2014	61
Cloverdale	55.2	62.2	61.7 in 2004	60
Monterey	53.1	58.6	58.0 in 2004	69
Mount Diablo Junction	50.8	58.7	58.4 in 2004	64
Pinnacles National Park	52.1	58.3	57.3 in 1972	77
Redwood City	54.8	60.0	59.9 in 2004	85
Salinas Airport	54.7	61.6	60.1 in 1934	83
San Rafael	54.1	60.0	59.5 in 1972	69
San Francisco Airport	54.9	60.3	59.4 in 2004	71
Santa Cruz	55.4	60.8	60.7 in 1926	123
Watsonville	54.2	59.5	59.2 in 1934	102

Thirteen additional climate stations had their **second warmest March**. In most cases, the warmest March occurred in 2004.

Second Warmest March on Record				
Location	Normal March Average Temp	March 2015 Average Temp	Warmest March and Year	Length of Climate Record (yrs)
Angwin	50.8	58.1	59.9 in 2004	64
Berkeley	55.0	59.7	60.0 in 2004	117
Gilroy	55.9	60.2	62.6 in 2004	59
Kentfield	54.3	59.6	60.4 in 2004	111
King City	56.2	60.6	61.2 in 2004	83
Livermore	54.8	59.5	59.8 in 2004	113
Los Gatos	54.3	59.8	60.1 in 1934	122
Mount Hamilton	44.5	53.6	53.7 in 2004	68
Napa	55.1	60.2	61.8 in 2004	117
Newark	56.1	60.5	61.5 in 2004	73
Richmond	55.7	60.9	61.2 in 2004	66
Salinas	54.2	59.6	59.7 in 2004	57
San Jose	56.2	60.8	61.5 in 2004	116

Downtown San Francisco, with 141 years of temperature records, experienced its 5<sup>th</sup> warmest March. March was the 17<sup>th</sup> consecutive month in which the average monthly temperature at Downtown San Francisco was above normal. October 2013 was the last time San Francisco experienced a cooler-than-normal month.

## March Regional Temperature Summary

Location	Average High	Normal High	Departure from Normal	Average Low	Normal Low	Departure from Normal
<b>North Bay</b>						
Angwin	70.0	60.7	9.3	46.1	40.8	5.3
Calistoga	72.9	67.2	5.7	46.2	40.4	5.8
Cloverdale	78.0	67.2	10.8	46.4	43.1	3.3
Kentfield	72.4	64.2	8.2	46.8	44.4	2.4
Napa	74.8	66.6	8.2	45.5	43.5	2.0
Napa Airport	69.1	64.1	5.0	41.4	40.2	1.2
Occidental	69.1	61.7	7.4	47.4	44.6	2.8
Petaluma Airport	70.9	65.1	5.8	42.9	42.3	0.6
San Rafael	71.8	62.9	8.9	48.2	45.3	2.9
Sonoma County Airport	72.4	64.1	8.3	43.1	41.5	1.6
Sonoma	72.6	65.4	7.2	42.8	41.8	1.0
<b>San Francisco Peninsula</b>						
Half Moon Bay	64.2	59.9	4.3	45.2	42.7	2.5
Redwood City	72.7	64.9	7.8	47.2	44.7	2.5
San Francisco Airport	68.9	62.1	6.8	51.7	47.7	4.0
San Francisco Downtown	67.5	61.8	5.7	52.4	48.5	3.9
<b>East Bay</b>						
Antioch	74.5	65.5	9.0	50.3	45.3	5.0
Berkeley	70.7	64.2	6.5	48.7	45.7	3.0
Concord	74.3	66.5	7.8	50.3	46.4	3.9
Concord Airport	74.0	65.8	8.2	48.8	45.0	3.8
Fremont	73.1	65.3	7.8	48.5	46.3	2.2
Hayward Airport	71.2	63.7	7.5	51.5	47.4	4.1
Livermore	73.7	65.6	8.1	45.2	43.9	1.3
Livermore Airport	74.8	64.6	10.2	45.5	42.4	3.1
Martinez	71.9	66.3	5.6	43.8	40.7	3.1
Mount Diablo Junction	67.3	59.8	7.5	50.0	41.8	8.2
Newark	70.2	64.5	5.7	50.8	47.7	3.1
Oakland	72.0	63.9	8.1	51.6	48.5	3.1
Oakland Airport	68.5	62.6	5.9	48.4	46.1	2.3
Richmond	71.0	63.9	7.1	50.7	47.5	3.2
<b>South Bay and Santa Cruz County</b>						
Gilroy	76.4	68.5	7.9	44.0	43.3	0.7
Los Gatos	74.3	65.6	8.7	45.3	42.9	2.4
Moffett Federal Airfield	71.0	65.0	6.0	49.3	47.3	2.0
Mount Hamilton	60.2	50.4	9.8	47.0	38.6	8.4
San Jose	72.7	65.7	7.0	48.8	46.6	2.2
Santa Cruz	75.9	66.4	9.5	45.6	44.4	1.2
Watsonville	73.1	64.4	8.7	45.9	43.9	2.0
Watsonville Airport	72.8	62.9	9.9	47.3	43.5	3.8

Monterey and San Benito Counties	Average High	Normal High	Departure from Normal	Average Low	Normal Low	Departure from Normal
Big Sur Station	72.1	63.4	8.7	47.2	43.4	3.8
Carmel Valley	74.9	65.8	9.1	42.7	42.1	0.6
Hollister	74.4	66.1	8.3	44.8	42.4	2.4
King City	78.4	70.2	8.2	42.8	42.1	0.7
Monterey	68.9	60.8	8.1	48.3	45.4	2.9
Monterey Airport	67.1	60.7	6.4	47.8	45.6	2.2
Pinnacles National Park	77.2	66.6	10.6	39.3	37.6	1.7
Salinas	73.7	65.1	8.6	45.4	43.3	2.1
Salinas Airport	74.6	64.7	9.9	48.6	44.7	3.9

Daily High Temperature Records for March 2015			
Date	Location	Record Max Temp	Previous Record and Year
3/6	Salinas	80 (tie)	80 in 1993
3/7	Oakland Museum	78	76 in 2004
3/13	Gilroy	83 (tie)	83 in 2007
3/13	Salinas	83 (tie)	83 in 2013
3/13	Salinas Airport	85 (tie)	85 in 1947
3/14	San Francisco Downtown	84	81 in 2007
3/14	San Francisco Airport	83	79 in 1947
3/14	Richmond	87	80 in 2004
3/14	Oakland Museum	81 (tie)	81 in 2004
3/14	Oakland Airport	80	77 in 2004
3/14	Moffett Federal Airfield	83	82 in 2004
3/14	San Jose	89	81 in 2004
3/14	Gilroy	90	87 in 2013
3/14	Santa Cruz	89	82 in 1926
3/14	Monterey	87	76 in 2004
3/14	Salinas	90	77 in 2004
3/14	Salinas Airport	92	84 in 1951
3/26	San Francisco Airport	79 (tie)	79 in 1952
3/26	Oakland Museum	83	80 in 1988
3/26	Moffett Federal Airfield	84	83 in 1988
3/26	San Jose	85	84 in 1988
3/26	Gilroy	90	87 in 1997
3/26	Santa Cruz	89	88 in 1988
3/26	Salinas Airport	90	87 in 1988
3/26	King City	91	89 in 1988
3/28	San Rafael	81 (tie)	81 in 1969
3/28	Napa	83 (tie)	83 in 1969
3/28	Oakland Museum	79	76 in 2003
3/28	Livermore	82 (tie)	82 in 1969
3/28	Gilroy	87	84 in 1969
3/29	Livermore	85	84 in 1968
3/29	Moffett Federal Airfield	77 (tie)	77 in 1968
3/29	Santa Cruz	86	83 in 1911



**Miscellaneous March Climate Information:**

Monthly Ranks for Downtown San Francisco		
Average High Temperature	67.5 deg	6 <sup>th</sup> warmest March out of 141 years
Average Low Temperature	52.5 deg	5 <sup>th</sup> warmest March out of 141 years
Average Mean Temperature	60.0 deg	5 <sup>th</sup> warmest March out of 141 years
Precipitation	0.12 in	4 <sup>th</sup> driest March out of 166 years

Monthly Extremes for Select Locations			
Location	Max Temp: Warmest Day(s)	Min Temp: Coolest Day(s)	Precipitation: Wettest Day(s)
Sonoma County Airport	3/26	3/01 3/04	3/22
	83 degrees	33 degrees	0.06 inches
San Francisco Downtown	3/14	3/04	3/23
	84 degrees	48 degrees	0.07 inches
Livermore Airport	3/29	3/06	3/11
	86 degrees	36 degrees	0.09 inches
San Jose	3/14	3/01 3/03	3/11
	89* degrees	39 degrees	0.10 inches
Salinas Airport	3/14	3/03	3/11
	92* degrees	40 degrees	0.10 inches

\*Both San Jose and the Salinas Airport set all-time March high temperature records on March 14.

**Other March 2015 Items:**

Sea surface temperatures remained well above normal during March. On March 14 the water temperature at the Monterey Bay buoy was at 61 degrees F. At the Cape San Martin buoy, the water temperature stood at 62 degrees F. These are record warm temperatures during the month of March at these buoys. Sea surface temperature data for these buoys date back to the 1980s.

Information on "climate normals": <http://www.ncdc.noaa.gov/data-access/land-based-station-data/land-based-datasets/climate-normals/1981-2010-normals-data>

**Note:** Climatological data included in this document is preliminary. For official certified climatological data please contact the National Climatic Data Center at 828-271-4800 or <http://www.ncdc.noaa.gov>. Official values as determined at the above web site may take several months for authentication and publication.